S18QUIZ: EXP LOG (PRACTICE V1)
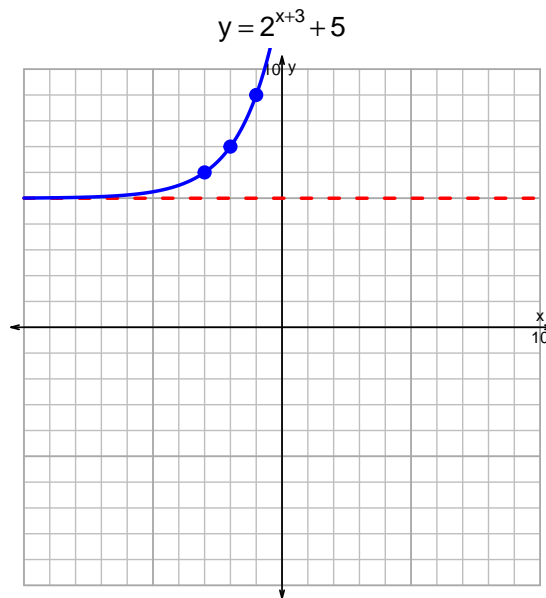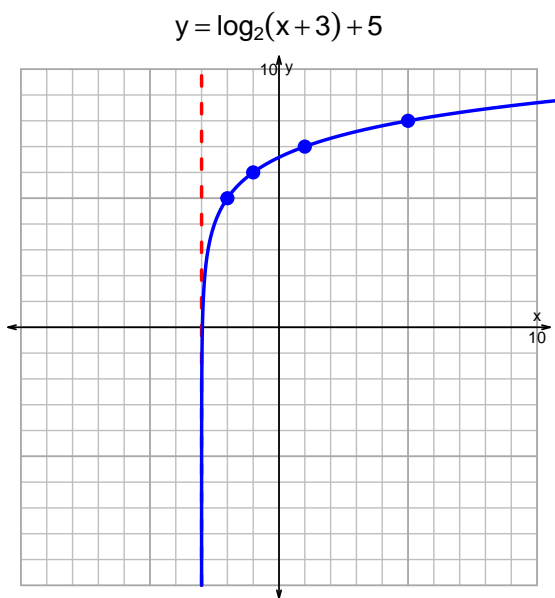
1. Graph $y = \log_2(x+3) + 5$ and $y = 2^{x+3} + 5$ on the grids below. Also, draw any asymptotes with dashed lines.

$y = \log_2(x+3) + 5$

$y = 2^{x+3} + 5$

2. Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression. Please do not do any arithmetic; just move numbers around.

$$11 = \left(\frac{3}{7}\right) \cdot 2^{5t/4}$$

Divide both sides by $\frac{3}{7}$.

$$\frac{11 \cdot 7}{3} = 2^{5t/4}$$

Take log, base 2, of both sides.
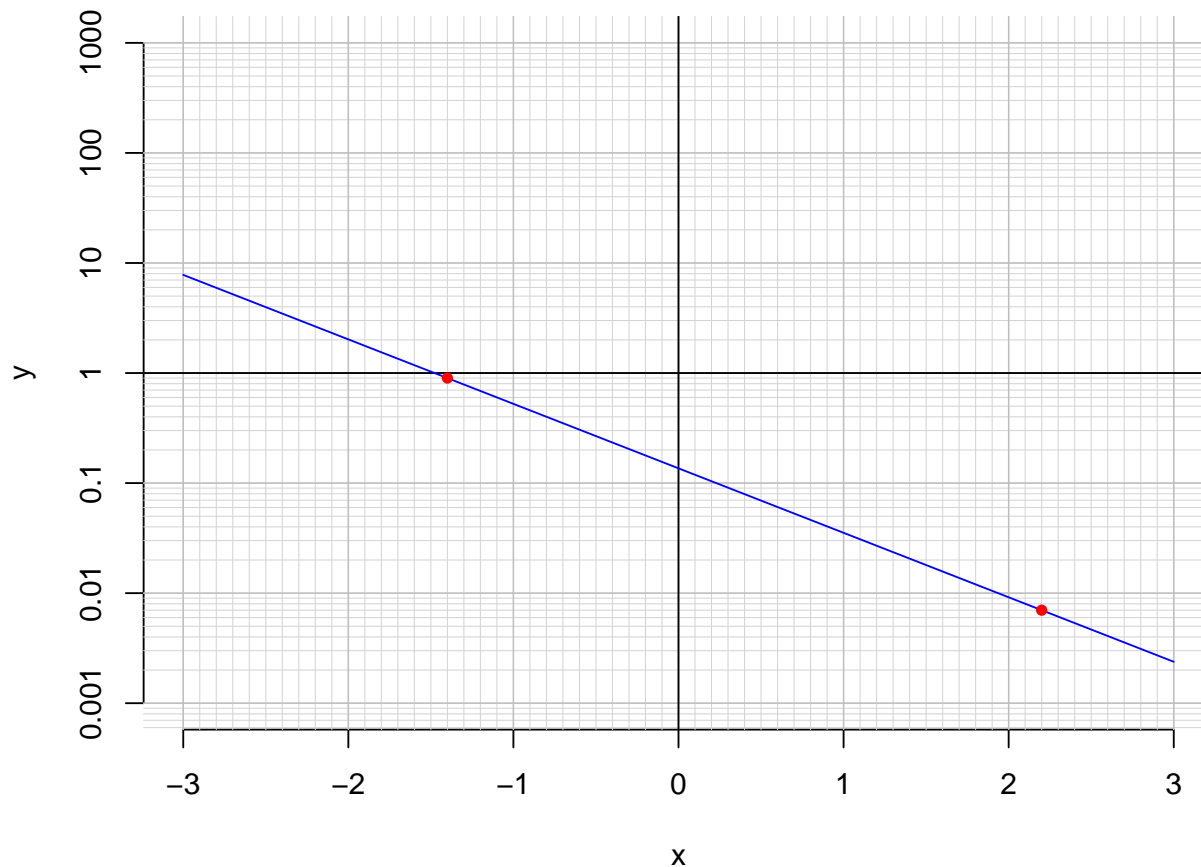
$$\log_2\left(\frac{11 \cdot 7}{3}\right) = \frac{5t}{4}$$

Divide both sides by $\frac{5}{4}$.

$$\frac{4}{5} \cdot \log_2\left(\frac{11 \cdot 7}{3}\right) = t$$

Switch sides.

$$t = \frac{4}{5} \cdot \log_2\left(\frac{11 \cdot 7}{3}\right)$$

3. An exponential function $f(x) = 0.136 \cdot e^{-1.35x}$ is graphed below on a semi-log plot.

a. Using the plot above, evaluate $f(2.2)$.

$$f(2.2) = 0.007$$

b. Express $f^{-1}(x)$, the inverse of f, with an algebraic expression.

$$f^{-1}(x) = \frac{-1}{1.35} \cdot \ln\left(\frac{x}{0.136}\right)$$

c. Using the plot above, evaluate $f^{-1}(0.9)$.

$$f^{-1}(0.9) = -1.4$$